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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/788,263	Applicant(s) ORTIZ ET AL.	
	Examiner Stephen J Kenny	Art Unit 3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13,15-23,35-40,46-49 and 59-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13,15-23,35-40,46-49 and 59-67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13, 15-19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins III (US Patent No 5639989) in view of DiLeo (US Patent No 5968600).

Higgins discloses a method of EMI shielding by encapsulating an electronic component with a conforming insulating base coating (column 6, lines 20-22); applying a first conductive layer over the base coating (column 6, lines 64-66); grounding the conductive layer to a ground trace to form an EMI shield for the electric component (column 7, lines 47-51).

Regarding claim 16, Higgins discloses the first conductive layer comprises copper (column 7, line 35 & line 40).

Regarding claim 17, Higgins discloses applying a second conductive layer over the first conductive layer (column 9, lines 47-54).

Regarding claims 18 & 19, Higgins discloses applying a conformal insulating layer of the conductive layer (column 6, line 21) wherein said insulating layer is waterproof (column 6, line 31, i.e. polyurethane is waterproof).

Regarding claim 21, Higgins discloses positioning the ground trace or "ring" around a periphery of the component (column 7, lines 47-51 & item 19 in Figure 2).

Higgins does not explicitly disclose applying the conductive layer via vacuum metallizing, and maintaining the temperature of the component and base coating below 200°C.

DiLeo discloses applying an EMI coating via vacuum metallizing (column 1, line27), as well as maintaining a temperature below 200°C (column 4, lines 36-40). Vacuum metallizing is a cost effective, environmentally desirable, and consistent technique for forming EMI shields as disclosed by DiLeo in column 1, line 26. Furthermore, a curing temperature below 200°C provides good adhesion without distorting the substrate, as disclosed by DiLeo in column 4, line 41. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the EMI shield of Higgins via vacuum metallizing at a temperature below 200°C as taught by DiLeo in order to realize the advantages discussed above.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view of DiLeo and further in view of Gabower (*Thermoformed Vacuum Metallized Inserts For EMI Shielding of Electronic Devices*, Consumer Electronics Show, Flamingo Hilton and Tower, Las Vegas, Nevada, pp. 151-158).

Higgins/DiLeo, as modified above, discloses the instant invention except for adhering the conductive & insulative layers via a glow discharge process.

Regarding claim 20, Gabower discloses employing a glow discharge operation (page 156, 1st paragraph) when forming an EMI shield. Glow discharging is a preferred method of joining conformal coatings of dissimilar materials. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form an EMI shield as disclosed by

Higgins/DiLeo by using a glow discharge process as taught by Gabower in order to improve the adhesion of the insulator to the conductive layer.

Claims 22, 35, & 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view of DiLeo, and further in view of Denzene et al (US Patent No 6219258).

Regarding claims 22 & 35, Higgins/DiLeo, as modified above, discloses the instant invention except for forming a plurality of separated compartments wherein the ground trace is disposed between a first and second component (note, in regards to claim 35, DiLeo discloses an EMI shield of thermoplastic in claim 1, which is considered to be a "thermoform").

Denzene discloses a ground trace (76) between a first and second component (74) (column 1, lines 29-32) to form compartments (66 in Figures 3 & 5) which are shielded from each other (column 6, lines 34-38). The formation of EMI compartments for each component is advantageous in that it allows for varying degrees of protection. In other words, it allows one component a high degree of shielding, and an adjacent component a lower degree of shielding; thus enabling a more tailored shielding affect. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the EMI shield as disclosed by Higgins/DiLeo while disposing the ground trace between components to divide the circuit board into sections as taught by Denzene which would allow for different levels of EMI shielding depending on which components were housed in a given section.

Regarding claims 38-40, Denzene discloses coupling a conductive adhesive between the thermoform and the ground trace (column 7, line 60). The use of adhesive as a fastening/bonding means is notoriously well known in the art, and the particular choice of

fastening/bonding means employed is determined by the nature application the EMI shield is intended for (column 1, line 44). It is imperative that the ground trace be connected to the thermoform, however the means for forming that connection do not constitute a novel feature of the invention.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view of DiLeo.

Higgins discloses the claimed invention except for exposing the ground trace through the insulating coating. It would have been an obvious matter of design choice to expose the ground trace through the insulating coating, since applicant has not disclosed that exposing said ground through the insulating coating solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the Higgins configuration (column 5, lines 16-18). In other words, it is necessary for the ground trace to be in contact with the conductive layer in order to pass any current or charge away from the protected component. So coating said ground with the insulating coating, to then remove or "expose" said ground is an additional step not required by Higgins.

Claims 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gabower in view of Denzene (US Patent No 6219258).

Regarding claim 46, Gabower discloses the instant invention as discussed above except for forming a plurality of compartments and separating electronic components into separate compartments.

Denzene discloses forming and grounding separate compartments of a circuit board wherein each section houses various components (column 1, lines 29-40 & Figures 3, 5). The formation of EMI compartments for each component is advantageous in that it allows for varying degrees of protection. In other words, it allows one component a high degree of shielding, and an adjacent component a lower degree of shielding; thus enabling a more tailored shielding affect. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the EMI shield as disclosed by Gabower while disposing the ground trace between components to divide the circuit board into sections as taught by Denzene which would allow for different levels of EMI shielding depending on which components were housed in a given section.

Regarding claim 47, Gabower disclose a substrate of injection molded plastic (page 153, 1st paragraph).

Regarding claims 48 & 49, Denzene discloses contacting attachment surfaces (walls) against the ground trace between the electronic components, wherein the attachment surfaces completely surround the electronic components (column 1, lines 25-45).

Claims 59-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lacey (US Patent No 6271465) in view of Askew (US Patent No 6350951).

Regarding claim 59, Lacey discloses an EMI shield by attaching a base portion (PCB 5B) of a metallized substrate to the ground trace (TRACE 5A) surrounding an electronic component

(column 3, lines 65 – column 4, line 5) and having a metalized top layer (14). Lacey does not disclose removably coupling a top portion to the base portion.

Askew discloses removing the top portion (which is a metalized layer – column 3, line 29) of a circuit board cover to expose the electrical components (column 1, lines 44-49). Forming an EMI shield with a removable top/cover is advantageous in that it allows the circuit/component to comply with FCC testing requirements (column 1, lines 34+). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form an EMI shielding substrate as disclosed by Lacey with a removable top portion to allow the enclosed electrical components to be tested.

Regarding claim 60, Lacey discloses positioning a conductive adhesive (18) over a ground trace (5A) (Figure 3A).

Regarding claims 61, 62, 64, & 65, Lacey discloses the instant invention except for overlapping a bottom portion with the top portion, comprising protrusions spaced no larger than one-half a wavelength apart, and inserting a tab in a groove of the bottom portion. It would have been an obvious matter of design choice to overlap the top & bottom portions, space protrusions less than one-half a wavelength apart, and insert a tab into a groove of the bottom portion, since applicant has not disclosed that such an overlapping or tab & groove solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the Lacey configuration.

Regarding claim 63, Lacey discloses protrusions or "ribs" (12) between a periphery of the top portion and the bottom portion of the EMI shield (Figure 3A).

Regarding claim 66, thermally evaporating is a process known and well established within the art as a functional equivalent of vacuum metallizing, spraying, screen or stencil printing, dip-coating, etc.

Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lacey in view of Askew and further in view of Gabower (*Thermoformed Vacuum Metallized Inserts For EMI Shielding of Electronic Devices*, Consumer Electronics Show, Flamingo Hilton and Tower, Las Vegas, Nevada, pp. 151-158).

Lacey/Askew, as modified above, disclose the instant invention except for the substrate body comprising a thermoform or injection molded plastic.

Gabower discloses forming a substrate body out of injection molded plastic (page 153, 1st paragraph). Injection molding is a well established operation that provides cost effective and large scale manufacturing. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the EMI shield disclosed by Lacey/Askew with a injection molded plastic as taught by Gabower to realize the cost effectiveness of injection molding.

Response to Arguments

Applicant's arguments filed 4/7/03 have been fully considered but they are not persuasive.

With regards to claims 13, 15-23 the applicant has put forth the argument that the U.S.C. 103 rejection is invalid due to an improper motivation to combine the references, since the DiLeo

reference states that vacuum metallizing is unsuitable for volume production. This limitation of vacuum metallizing is not considered relevant because the applicant in no way claims, nor discloses, that the instant invention is intended for volume production. Thus the inability to vacuum metallize components for volume production would in no way impede an artisan of ordinary skill from performing the claimed invention. Furthermore, the DiLeo reference cites several advantages (i.e. cost effective, environmentally desirable, and consistent as stated in column 1, lines 27) of vacuum metallizing, any one of which would serve as a reasonable motivation to combine the DiLeo reference with the Higgins reference.

With regards to claim 35, the applicant has put forth the argument that the U.S.C. 103 rejection is improper because the cited references fail to teach all of the limitations claimed (i.e. the use of an adhesive). The examiner directs the applicant's attention to column 7, line 60 of the Denzene reference, where it explicitly states that an adhesive may be employed to form a bond between the shield and ground trace. Additionally, as the applicant concedes on page 9, lines 27-28, the use of an adhesive is merely a design choice since "the metallized layer 44 may be coupled to the ground trace 32a, 32b in a variety of ways".

With regards to claim 59, applicant has put forth the argument that the U.S.C. 103 rejection is improper because the cited references fail to teach all of the claimed limitations. The examiner traverses this argument and has clearly indicated that in fact both the Lacey & Askew references disclose a metallized top portion (see rejection above). The Askew reference clearly discloses removing said top metallized portion as explained above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J Kenny whose telephone number is 703-306-0359. The examiner can normally be reached on mon - fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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4/30/04

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